



The Atmospheric Fund
75 Elizabeth Street
Toronto, ON M5G 1P4

taf.ca | info@taf.ca
@AtmosphericFund
416-392-0271

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Planning and Growth Management Committee
City Hall
Toronto, ON M5H 2N2

RE: TORONTO GREEN STANDARD REVIEW AND UPDATE (PG23.9)

Dear Committee Members

The City of Toronto took a leadership position in 2010 when it adopted the Toronto Green Standard (TGS) for new construction. The TGS V1 was critical in reversing a 30-year trend towards worsening energy performance in new buildings. The adoption of TGS V2 in 2014 reaffirmed Toronto's leadership and put Toronto at the forefront of green development standards in North America. However, due to advancements in technology as well as building code changes, the energy efficiency standard set in TGS V2 is now obsolete. It is time for Toronto to take the next step in green building leadership by adopting TGS V3.

The Atmospheric Fund (TAF) strongly supports the adoption of TGS V3, which will put Toronto on the pathway to near zero emissions in new construction. In preparation for this update, TAF and City Planning jointly undertook a 2 year research and consultation project to develop recommendations for increased performance standards. Research and development of TGS V3 was undertaken with the support of the Environment and Energy Division, Toronto Building, and a stakeholder advisory group including leading architects, engineers, developers, academics, building operators, and provincial representatives. The result was the [Zero Emissions Buildings Framework](#), which forms the basis of the proposed *Energy Efficiency, GHG and Resilience* standards in TGS V3. Moreover, the Framework provides a roadmap to near zero emissions buildings for Toronto, laying out the energy and GHG requirements envisioned for future updates to the TGS through to 2030.

The Importance of achieving Near Zero Emissions

As Toronto continues to grow in leaps and bounds, it's imperative to get emissions from new construction under control if we want to reach our 2050 climate target. That's why *one of the key [City Council approved commitments in the Transform TO climate plan is achieving near zero emissions in all new buildings by 2030.](#)*

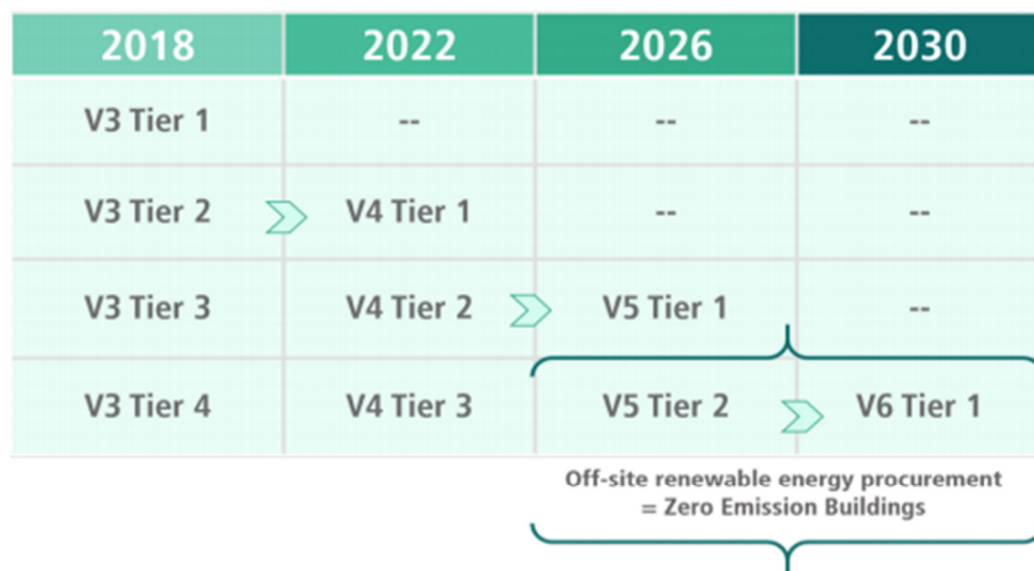
Just how important is the near zero goal? While retrofitting existing buildings is a big priority as well, [Toronto's population is projected to grow by over 35%](#) by 2050. That means a massive build-out of residential and commercial real-estate that must be highly energy efficient. ***If built to current standards, these future buildings would consume Toronto's entire 2050 carbon budget!***

TAF's own GHG modelling found that achieving near zero in new construction by 2030 was critical to achieving the 80% by 2050 target. The critical importance of the 2030 near zero target was confirmed by the extensive energy and emissions [modelling work done for Transform TO](#). Simply put, ***if Toronto does not transition to near zero emissions in new construction, any progress we make in retrofitting existing buildings will be offset by growth.***

Creating a Pathway to Near Zero Emissions

In developing the TGS V3, TAF and the City began with a [global review of best practices](#) in energy and carbon standards for new construction. One of the key recommendations from that study was to develop a long-term vision and goals to guide the evolution of the standard and provide clear direction to industry. This was the genesis of the near zero emissions target for 2030, as well as the decision to create four tiers of performance in the TGS. We started by defining precisely what near zero emissions means for Toronto. We then worked backward to create interim performance targets for 2026, 2022, and 2018. This resulted in four tiers of performance: Tier 1 is the proposed minimum design target for all new buildings beginning May 2018, while Tiers 2, 3 and 4 are voluntary stretch targets with a financial incentive for industry leaders willing to meet them. The idea is that every four years, we eliminate the lowest Tier, until Tier 4 – near zero emission – becomes the minimum design target in 2030 (see figure 1 below). ***With a series of targets and a clear timetable in place, the buildings industry will have the regulatory certainty it needs to focus on optimizing the technologies and design approaches to cost-effectively deliver a low carbon future.***

Figure 1: Pathway to Near Zero Emissions Buildings



Transitioning to a Performance Targets Approach

One of the other key recommendations from the global review of best practices was to transition to the use of clear performance targets directly related to Toronto's core objectives. Up to now, the TGS energy efficiency requirements have always been specified in terms of a percentage better than the Ontario Building Code (OBC), which itself references a number of other building design standards. The problem is that ***percentage above code is almost completely uncorrelated with energy use or greenhouse gas emissions - the very things we are trying to reduce!*** Recent research on a large sample of new buildings in Toronto revealed that using a percentage above code method did not predictably result in lower modelled energy use intensity or carbon intensity. This finding has been replicated in several other studies in other regions, prompting numerous jurisdictions to shift to a performance targets based approach, including the City of Vancouver and the Province of British Columbia.

Drawing on best practices from around the world, TGS V3 is based on a set of three performance metrics that are directly related to Toronto's core objectives.

- **Thermal Energy Demand Intensity** targets ensure buildings have better envelopes (i.e. walls, windows, and roofs), which will ***result in long-lasting energy savings and enhanced resiliency*** by extending the length of time buildings can remain habitable during power outages or HVAC system failures.

- **Energy Use Intensity** targets ensure *lower overall energy use and costs* across all building systems and *enhanced affordability for owners and operators*.
- **Greenhouse Gas Intensity** targets encourage the use of lower carbon fuels while allowing flexibility to use natural gas as long as the total GHG target is achieved. *Since the policy priority is achieving near zero emissions, GHG targets are absolutely critical.*

The shift from percentage above code to the proposed performance targets is absolutely critical to achieving predictable progress on Toronto's core objectives, and getting onto a pathway to near zero emissions. *The proposed performance targets will result in enhanced resiliency, improved affordability, and most importantly reduced emissions.*

TGS V3 is Cost Effective and Will Generate Net Economic Benefits

To ensure the proposed performance targets are technically feasible and cost effective, the project team ran thousands of building energy simulations of major building archetypes. The most sensible strategies for achieving each tier were then costed out in comparison to a building built to current standards. The findings from this extensive simulation and costing research are summarized below

- *All four performance tiers can be achieved using materials and technologies that are available on the market today.*
- Incremental construction costs for the proposed Tier 1 standard are estimated to be between 0.5% to 2.3% for all building types.
- The cost premium per suite for multi-residential buildings is estimated at well under 1% of the average sale value of new condominium units.
- *Buildings built to TGS will benefit from lower energy costs resulting in net lifecycle cost savings* over a 25 year period.

Conclusion

New buildings approved today will be part of our City for the next century. Building them efficiently is far more cost effective than retrofitting them down the road. The proposed TGS V3 will result in cost effective buildings with enhanced resiliency, lower energy costs, and dramatically reduced emissions. Implementing the proposed framework will reduce Toronto's emissions by a cumulative total of over 30 megatonnes by 2050. *TAF strongly recommends adoption of TGS V3, which will put in place the first major policy to deliver on the Transform TO climate plan and turn Toronto into a low-carbon City.*

Sincerely,

Bryan Purcell
Director of Policy and Programs
The Atmospheric Fund

Figure 2: Zero Emissions Building Framework Infographic

